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The Mineral Industry of Kentucky

UNITED STATES DEPARTMENT OF THE INTERIOR

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This publication is a chapter from the current Bureau of Mines Minerals Yearbook, comprising *Volume I, Metals and Minerals; Volume II, Area Reports: Domestic; Volume III, Area Reports: International.* The separate volumes of the Yearbook are sold by the Superintendent of Documents, Washington, D.C. 20402.

The Mineral Industry of Kentucky

This chapter has been prepared under a Memorandum of Understanding between the Bureau of Mines, U.S. Department of the Interior, and the Kentucky Geological Survey for collecting information on all nonfuel minerals.

By L. J. Prosser, Jr.,[1] and Garland R. Dever, Jr.[2]

The value of nonfuel mineral production in Kentucky in 1987 was about $290 million; the State ranked 30th nationally in value. Production of crushed stone, the State's leading nonfuel mineral commodity, increased by about 5 million short tons. That gain reflected strong demand from the construction industry and primarily accounted for the increase in total State value. The other mineral commodities produced in Kentucky showed less significant changes in output and value compared with 1986.

Kentucky remained the leading coal-producing State in the Nation. The coal industry was a significant component of the State's economy and provided a market for some nonfuel minerals. Developments in environmental and energy-related technologies continued to improve the market for the State's crushed limestone industry.

Table 1.—Nonfuel mineral production in Kentucky[1]

Mineral	1985		1986		1987	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays thousand short tons	775	$6,487	[2]721	[2]$3,450	1,031	$8,821
Gem stones	NA	[e]1	NA	3	NA	3
Sand and gravel (construction) thousand short tons	[e]7,600	[e]19,000	7,194	16,986	[e]7,100	[e]15,200
Stone (crushed) do.	[3]38,022	[3]134,978	[e] [3]38,400	[e] [3]137,000	43,330	173,222
Zinc metric tons	W	W	W	W	10	9
Combined value of cement, clays (ball clay and fire clay, 1986), lime, sand and gravel (industrial), stone (crushed sandstone, 1985-86), and values indicated by symbol W	XX	107,092	XX	109,826	XX	93,080
Total	XX	267,558	XX	267,265	XX	290,335

[e]Estimated. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" figure. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Excludes certain clays; kind and value included with "Combined value" data.

[3]Excludes certain stones; kind and value included with "Combined value" data.

Table 2.—Nonfuel minerals produced in Kentucky in 1986, by county[1]

County	Minerals produced in order of value
Boone	Sand and gravel.
Boyd	Clays.
Breckinridge	Sand and gravel.
Bullitt	Clays.
Calloway	Sand and gravel.
Carlisle	Clays.
Carroll	Sand and gravel.
Carter	Clays.
Clinton	Sand and gravel.
Daviess	Do.
Graves	Clays, sand and gravel.
Hancock	Clays.
Hart	Sand and gravel.
Henderson	Do.
Jefferson	Cement, sand and gravel, clays.
Lewis	Sand and gravel.
Livingston	Do.
Martin	Do.
Meade	Do.
Oldham	Do.
Powell	Clays.
Trimble	Sand and gravel.
Union	Do.
Whitley	Clays.
Undistributed[2]	Stone (crushed), gem stones.

[1]No production of nonfuel mineral commodities was reported for counties not listed.
[2]Data not available by county for minerals listed.

Legislation and Government Programs.—The Kentucky Supreme Court ruled in 1987 that the "broad-form deed" law passed by the Kentucky General Assembly in 1984 was unconstitutional and that surface mining is permissible under broad-form deeds. The 1984 law had limited mining under broad-form deeds to the method commonly known to be in use in the affected area at the time the deeds were signed, generally underground mining. It had essentially barred surface mining by the mineral owner without the surface owner's permission. The Supreme Court also reversed the 1956 State court decision in *Buchanan* v. *Watson*, which ruled that coal companies operating under broad-form deeds did not have to compensate surface owners for damages. However, an exemption from paying damages applies to deeds signed between May 6, 1956, and July 2, 1987.[3]

The State Supreme Court also was expected to rule in 1988 on the validity of the nominal tax rate levied on unmined coal reserves. The rate of one-tenth of one cent per $100 of assessed valuation was ruled unconstitutional in circuit court. If the Supreme Court upholds that decision, the coal industry tax rate could increase to twenty-one and four-tenths cents, the rate assessed on other property in the State.

The Kentucky Geological Survey and U.S. Geological Survey were considering a 3-year pilot program to determine coal resources available for economic development in eastern Kentucky. Resource estimates in the past were made without consideration for land use and technological factors that restrict or prohibit mining.

The University of Kentucky was awarded a contract by Cyprus Minerals Co. for research into long-term land development on the company's 17,000-acre Star Fire tract in eastern Kentucky where coal is recovered by mountain-top-removal methods. The purpose of Cyprus' Star Fire project was to develop plans for alternate land uses beyond the basic revegetation requirements of the Federal Surface Mining Control and Reclamation Act (Public Law 95-87). Preliminary research activities included an assessment of the need for development in the region, water resources inventory, soils and vegetation study, and investigation of the potential for cattle grazing and for industrial development on the reclaimed land.[4]

REVIEW BY NONFUEL MINERAL COMMODITIES

INDUSTRIAL MINERALS

Industrial minerals accounted for nearly all of Kentucky's $290 million in value of nonfuel mineral production. Crushed limestone accounted for 60% of the total value; lime and cement along with small quantities of ball and fire clays, 34%; and sand and gravel and common clay, 6%. Fluorspar, which was last mined in Kentucky in 1978, was expected to be produced again in the State in 1988.

Fluorspar.—In December, Kentucky-Illinois Fluorspar Corp. reopened a flotation plant near Salem in Crittenden County. Fluorspar production had last been reported in the State in 1978 when Frontier Spar Corp. closed its Babb-Barnes underground mine. Earlier in the year, Kentucky-Illinois Fluorspar had purchased from USX Corp. all the fluorspar reserves, mines, and processing facilities formerly owned by Marathon Oil Co., Cerro Corp., and United States Steel Corp. Cerro had owned Frontier Spar Corp. Removal of the State severance tax on fluorspar and other selected mineral commodities by the Kentucky Legislature in 1984 contributed to the reopening of the operation.[8] Fluorspar was produced in only two States in 1987 and was used primarily as a flux by the steel industry; it also was used to produce hydrofluoric acid.

Stone.—Stone production is surveyed by the U.S. Bureau of Mines for odd-numbered years only; this chapter contains actual data for 1985 and 1987 and estimates for 1986. Data for even-numbered years are based on annual company estimates.

Crushed.—Traditionally, crushed limestone produced in Kentucky has been marketed for use by the agricultural, coal, construction, and steel industries. Demand from the construction industry typically depended on economic conditions. Beginning in 1983, lower interest and inflation rates resulted in favorable conditions for home and highway construction and crushed stone production in Kentucky has increased by 14 million short tons in the last 5 years. Output of 43 million tons in 1987 was the highest ever reported in State history. Demand for crushed stone remained strong in central Kentucky as construction of an automobile-manufacturing plant improved economic conditions in that area. Also in 1987, legislation was enacted to raise revenue for a State highway construction program through a decal tax on trucks weighing in excess of 60,000 pounds. Markets for limestone used in agriculture and steelmaking are stable and mature in Kentucky.

The market for Kentucky's limestone resources continued to expand for use in environmental and energy-related applications. During the year, five limestone producers had contracts to supply limestone used to abate sulfur dioxide emissions at coal-fired utility plants. The Tennessee Valley Authority (TVA) near Paducah was constructing a 160-megawatt demonstration plant to test a fluidized-bed combustion technology system that was expected to utilize 2.80 tons of limestone per 1.0 ton of coal burned. The ratio of limestone per ton of coal burned depended on the sulfur content of the coal. Previously, the TVA had successfully used fluidized-bed combustion technology in a 20-megawatt pilot plant.

Limestone products were also used by the coal industry as rock dust for health and safety purposes in underground mines, to treat acid mine drainage, and in surface mine reclamation. The Kentucky Energy Cabinet (KEC) was involved in the TVA projects and in other technological research such as atmospheric fluidized-bed combustion designed to reduce sulfur dioxide emissions from coal-burning utilities. The KEC also analyzed limestone samples for possible commercial use as rock dust.

In 1985, the U.S. Bureau of Mines began compiling crushed stone statistics by districts for some States. Table 4 presents end-use data for crushed stone produced in the four Kentucky districts depicted in figure 1.

Table 3.—Kentucky: Crushed stone[1] sold or used by producers in 1987, by use

(Thousand short tons and thousand dollars)

Use	Quantity	Value
Coarse aggregate (+1-1/2 inch):		
Riprap and jetty stone	1,746	6,729
Filter stone	434	1,781
Coarse aggregate, graded:		
Concrete aggregate, coarse	3,352	12,402
Bituminous aggregate, coarse	3,633	14,464
Bituminous surface-treatment aggregate	1,083	3,860
Railroad ballast	97	421
Fine aggregate (-3/8 inch):		
Stone sand, concrete	319	975
Stone sand, bituminous mix or seal	1,056	4,082
Screening, undesignated	852	2,463
Coarse and fine aggregates:		
Graded road base or subbase	7,334	28,002
Unpaved road surfacing	1,121	4,093
Crusher run or fill or waste	1,496	5,476
Other construction[2]	195	706
Agricultural, agricultural limestone	1,656	5,993
Special: Other miscellaneous[3]	3,974	24,510
Other unspecified[4]	14,981	57,265
Total	[5]43,330	173,222

[1]Includes limestone, dolomite, and sandstone.
[2]Includes macadam.
[3]Includes poultry grit and mineral food, cement manufacture, lime manufacture, flux stone, chemical stone for alkali works, sulfur oxide removal, and mine dusting and acid water treatment.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.
[5]Data do not add to total shown because of independent rounding.

Table 4.—Kentucky: Crushed stone sold or used by producers in 1987, by use and district

(Thousand short tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Coarse aggregate (+1-1/2 inch)[1]	1,015	3,366	204	853	793	3,733	222	789
Coarse aggregate, graded[2]	1,345	4,552	1,336	5,437	4,288	17,100	1,197	4,057
Fine aggregate (-3/8 inch)[3]	382	1,246	386	1,508	896	2,623	563	2,143
Coarse and fine aggregates[4]	1,908	6,307	1,830	7,345	4,457	17,693	1,757	6,227
Other construction	46	96	--	--	85	363	11	16
Agricultural[5]	289	955	469	1,972	457	1,903	470	1,437
Chemical and metallurgical[6]	--	--	W	W	(7)	(7)	--	--
Special[8]	--	--	--	--	(7)	(7)	--	--
Other miscellaneous	52	96	--	--	3,181	22,008	--	--
Other unspecified[9]	4,771	17,181	2,273	8,782	5,885	22,585	2,763	10,851
Total[10]	9,807	33,798	6,499	25,897	20,041	88,007	6,983	25,520

W Withheld to avoid disclosing company proprietary data; included with "Other unspecified."
[1]Includes macadam, riprap and jetty stone, and filter stone.
[2]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, and railroad ballast.
[3]Includes stone sand (concrete), stone sand (bituminous mix or seal), and fine aggregate (screen).
[4]Includes graded road base or subbase, unpaved road surfacing, and crusher run or fill or waste.
[5]Includes agricultural limestone.
[6]Includes cement manufacture, lime manufacture, flux stone, and sulfur oxide removal.
[7]Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous."
[8]Includes mine dusting.
[9]Includes production reported without a breakdown by end use, estimates for nonrespondents, and data indicated by symbol W.
[10]Data may not add to totals shown because of independent rounding.

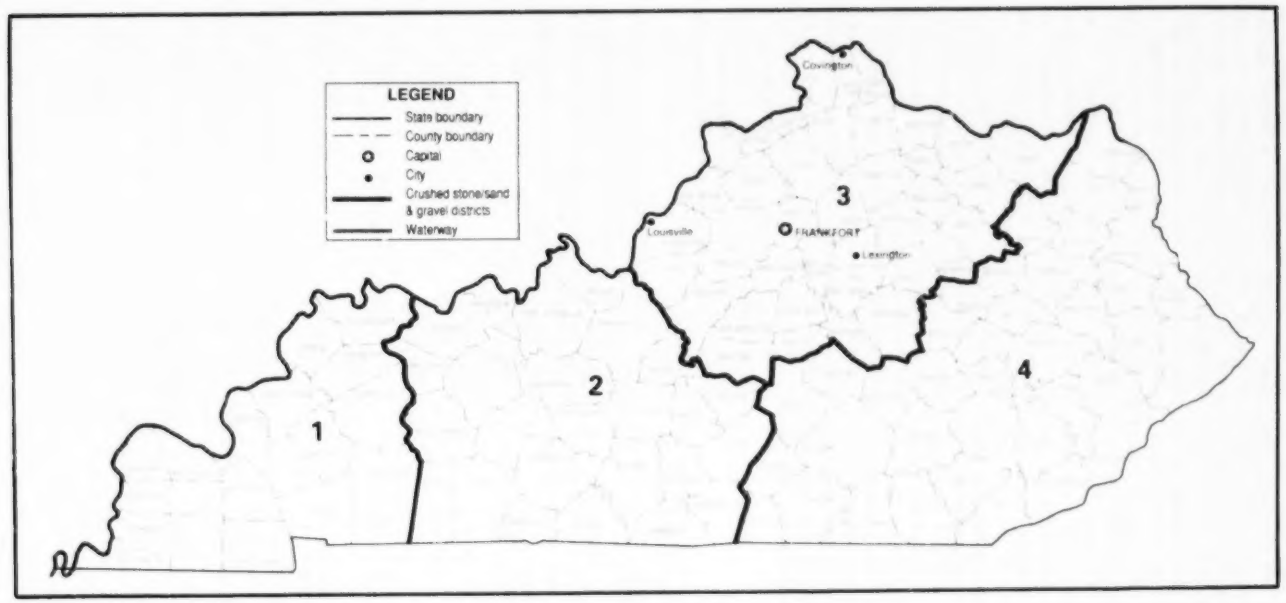

Figure 1.—Aggregate-producing districts in Kentucky.

Other Industrial Minerals.—In 1987, ball (4), common (12), and fire (1) clays were produced at 17 mines and pits. Corbin Brick Co. Inc., Whitley County, was purchased by General Shale Products Corp., a subsidiary of Marley PLC of the United Kingdom. In Marion, Crittenden County, a new company, CeraTech Inc., opened a plant to manufacture industrial and high-temperature advanced ceramics using ball clay. The firm expected to produce about 2,000 short tons of ceramics. Lime was produced by one company with two operations in Mason and Pendleton Counties. Most of the lime produced at the Mason County plant was used in sulfur dioxide control applications. Output of construction sand and gravel remained at the 7-million-ton level for the fourth consecutive year. Nugent Sand Co. purchased Martin Marietta Corp.'s Milton pit in Carroll County for an estimated $5 million. The sale also included a fleet of barges and plant equipment. Nugent also operated dredges based in Trimble County on the Ohio River.

METALS

A small quantity of zinc was recovered as a byproduct at an underground limestone mine in Jessamine County. The value of that production is included in the State total as given in table 1. Aluminum and steel were the major metals manufactured in the State. Production and value of these commodities was proprietary.

Aluminum.—In December, Alcan Aluminum Corp. decided to restart the third of its three potlines, returning its Sebree smelter to full capacity of 163,000 metric tons per year. Alcan and the State's other primary aluminum producer, National Southwire-Aluminum Co., were forced to pay an additional $7.1 million in October for electricity charges to the Big Rivers Electric Corp. The Franklin Circuit Court denied the two companies' request to place the funds in an escrow account pending an appeal to the Kentucky Public Service Commission on the rate structure that ties electricity rates to the market price for aluminum.

Iron and Steel.—Union workers at Armco Inc., the largest employer of the Ashland area with about 3,000 workers and the fifth-largest employer in the State, approved a concession package essentially lending the company $22.5 million for the purchase of a continuous-slab caster. Total cost of the caster was estimated at $82.4 million with construction expected to be completed by mid-1990. Armco decided on the modernization and expansion program because of the opening and continuing construction of three new Japanese automobile-manufacturing plants in Georgetown, KY; Smyrna, TN; and Marysville, OH.

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[1]State Mineral Officer, Bureau of Mines, Pittsburgh, PA.
[2]Geologist, Coal and Minerals Section, Kentucky Geological Survey, Lexington, KY.
[3]The Courier-Journal. Broad Form Deed Ruling Favors Some Landowners. July 3, 1987, p. 1.
Lexington Herald Leader. Strip-Mining Restrictions Struck Down. July 3, 1987, p. 1.
[4]Mining Engineering. May 1988, v. 40, No. 5, p. 323.
[5]Work cited in footnote 4.

Table 5.—Principal producers

Commodity and company	Address	Type of activity	County
Aluminum (primary):			
Alcan Aluminum Corp	Sebree, KY 42555	Smelter	Webster.
National-Southwire Aluminum Co.	Box M Hawesville, KY 42348	do	Hancock.
Cement:			
Kosmos Cement Co. Inc.[1 2]	Dixie Highway Box 72319 Louisville, KY 40272	Plant	Jefferson.
Clays:			
Ball clay:			
Kentucky-Tennessee Clay Co	Box 449 Mayfield, KY 42066	Mines and plant	Carlisle and Graves.
Old Hickory Clay Co	Box 66 Hickory, KY 42051	do	Graves.
Common clay:			
General Shale Products Corp	Box 3547 CRS Johnson City, TN 37602	Mine and plant	Jefferson and Whitley.
Kentucky Solite Corp	Box 27211 Richmond, VA 23261	do	Bullitt.
U.S. Brick Inc., Sipple Div	Box 567 Stanton, KY 40380	do	Powell.
Fire clay:			
Ford Burchett Clay Co	Route 1, Box 850 Olive Hill, KY 41164	Mine	Carter.
Ferroalloys:			
SKW Alloys Inc	Box 217 Calvert City, KY 42029	Plant	Marshall.
Graphite (synthetic):			
Ashland Petroleum Co., Carbon Fibers Div.[3]	Ashland, KY 41101	do	Boyd.
Sigri Carbon Corp	Box 229 Hickman, KY 42050	do	Fulton.
Superior Graphite Co	Box 535 Hopkinsville, KY 42240	do	Christian.
Iron and steel (pig iron):			
Armco Inc	Middletown, OH 45202	do	Boyd.
Newport Steel Corpp	9th & Lowell Sts. Newport, KY 41072	Plants	Campbell.
Lime:			
Dravo Lime Co., a subsidiary of Dravo Corp.[3]	One Gateway Center Pittsburgh, PA 15222	Mines and plants	Mason and Pendleton.
Perlite (expanded):			
International Permalite Co	300 North Haven Ave. Ontario, CA 91762	Plant	Boone.
Sand and gravel:			
Construction:			
Evansville Materials Inc	Box 249 Tell City, IN 47586	Dredges	Daviess.
Martin Marietta Corp.[3]	Box 30013 Raleigh, NC 27622	Pits	Carroll, Jefferson, Oldham.
Northern Kentucky Aggregates	11641 Mosteller Rd. Cincinnati, OH 45241	do	Boone.
Nugent Sand Co. Inc	Box 607.2 1833 River Rd. Louisville, KY 40206	Dredges	Trimble.
Industrial:			
Industrial Supply House of Greenup Inc	Box 647 422 Harrison St. Greenup, KY 41144	Pit	Lewis.
Stone (crushed):			
The Kentucky Stone Co	Box 7529 Louisville, KY 40207	Underground mines, quarries, plants.	Various.
Reed Crushed Stone Co	Box 35 Gilbertsville, KY 42044	Quarry and plant	Livingston.
Rogers Group Inc	Box 310 Shepherdsville, KY 40165	Quarries and plants.	Bullitt, Christian, Grayson, Oldham.
Three Rivers Rock Co	Box 218 Smithland, KY 42081	Quarry and plant	Livingston.
Vermiculite:			
W. R. Grace & Co	62 Whittemore Ave. Cambridge, MA 02140	Plant	Campbell.

[1]Also clays.
[2]Also stone.
[3]Also sulfur.

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